

In the Claims:

1 1. (currently amended) A method of producing an article
2 comprising a folded core structure, said method comprising
3 the steps:

4 a) providing a material web having an initial flat planar
5 configuration;

6 b) subjecting said material web having said initial flat
7 planar configuration to a continuous pretreatment
8 process comprising forming a repeating pattern of fold
9 lines in said material web from at least one of an
10 upper surface and a lower surface thereof; thereof
11 such that said material web with said repeating
12 pattern of fold lines still has said flat planar
13 configuration;

14 c) after said step b), initiating a formation of folds in
15 said material web along said fold lines on at least
16 one of said upper surface and said lower surface;

17 d) after said step c), carrying out and completing said
18 formation of said folds along said fold lines to
19 deform said material web from said initial flat planar
20 configuration into a three-dimensionally folded
21 configuration having an increased thickness relative
22 to said flat planar configuration, whereby said
23 initial flat planar configuration of said material web
24 undergoes a longitudinal contraction in a longitudinal
25 direction of said material web, a transverse
26 contraction in a transverse direction of said material

27 web, and a thickness expansion in a direction of said
28 thickness; and
29 e) after said step d), post-treating said material web to
30 stabilize said folded configuration thereof, to
31 produce therefrom a folded core structure.

1 2. (original) The method according to claim 1, further
2 comprising, after said step e), a further step of arranging
3 and attaching a respective cover layer on at least one
4 major surface of said folded core structure to produce
5 therefrom a composite structural panel.

1 3. (original) The method according to claim 1, wherein said
2 step a) comprises providing a web comprising composite
3 reinforcement fibers as said material web.

1 4. (original) The method according to claim 1, wherein said
2 longitudinal contraction, said transverse contraction and
3 said thickness expansion all occur simultaneously in a
4 single-stage folding process in said step d), and wherein
5 said single-stage folding process is carried out without
6 mechanical guidance of said material web parallel to said
7 fold lines.

1 5. (original) The method according to claim 1, wherein said
2 transverse contraction and said thickness expansion occur
3 together in a first stage of a folding process in said step
4 d) without said longitudinal contraction, and thereafter

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5 said longitudinal contraction occurs in a second stage of
6 said folding process, and further comprising compensating
7 for a travel distance variation of edge portions of said
8 material web relative to a center portion of said material
9 web during said first stage of said folding process.

1 6. (original) The method according to claim 1, wherein said
2 pretreatment process comprises at least one of embossing,
3 impressing, creasing, scoring, and perforating said fold
4 lines into said material web.

1 7. (original) The method according to claim 1, wherein said
2 pretreatment process further comprises at least one of
3 heating said material web, cooling said material web,
4 etching said material web, applying a binder to said
5 material web, and impregnating a resin into said material
6 web.

1 8. (original) The method according to claim 1, wherein said
2 post-treating in said step e) comprises at least one of
3 embossing, pressing, creasing, scoring, and perforating
4 said material web.

1 9. (original) The method according to claim 1, wherein said
2 post-treating in said step e) comprises at least one of
3 heating said material web, cooling said material web,
4 etching said material web, applying a binder to said

5 material web, and impregnating a resin into said material
6 web.

1 10. (original) The method according to claim 1, wherein said
2 initiating of said formation of said folds in said step c)
3 comprises directing a flow of a fluid at at least one of
4 said upper surface and said lower surface of said material
5 web.

1 11. (original) The method according to claim 1, wherein said
2 initiating of said formation of said folds in said step c)
3 comprises mechanically contacting at least one of said
4 upper surface and said lower surface of said material web
5 so as to begin said formation of said folds.

1 12. (original) The method according to claim 1, wherein said
2 completing of said formation of said folds in said step d)
3 comprises passing said material web between two bristle
4 brush rolls that respectively contact said upper surface
5 and said lower surface of said material web, whereby
6 respective bristles of said two bristle brush rolls
7 intermesh with each other as said material web is deformed
8 and folded along said fold lines between said respective
9 bristles of said two bristle brush rolls.

1 13. (original) A method of producing a folded structure,
2 comprising the steps:

3 a) providing a material web having an initial flat planar
4 configuration;

5 b) forming a repeating pattern of fold lines in said
6 material web by at least one of embossing, impressing,
7 creasing, scoring, and perforating said fold lines
8 into said material web still having said flat planar
9 configuration;

10 c) initiating a formation of folds in said material web
11 along at least some of said fold lines by directing
12 jets of a fluid at said material web;

13 d) passing said material web between two intermeshing
14 bristle brush rolls so as to further form said folds
15 in said material web, whereby said initial flat planar
16 configuration of said material web undergoes a
17 longitudinal contraction in a longitudinal direction
18 of said material web, a transverse contraction in a
19 transverse direction of said material web, and a
20 thickness expansion in a direction perpendicular to
21 said longitudinal direction and said transverse
22 direction, from said initiating of said formation of
23 said folds through said further forming of said folds,
24 so as to deform said material web from said initial
25 flat planar configuration to a resulting
26 three-dimensionally folded configuration; and

27 e) stabilizing said three-dimensionally folded
28 configuration by at least one of accentuating,

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29 pressing, strengthening, rigidifying, and fixing said
30 folds, so as to form a folded structure of said
31 material web having said three-dimensionally folded
32 configuration.

1 14. (currently amended) An apparatus for producing a structure
2 comprising a folded core structure fabricated from a planar
3 material web, said apparatus comprising:

4 a first arrangement for pre-treating the material web
5 from at least one of an upper surface and a lower surface
6 thereof to form fold lines ~~therein~~, therein while
7 maintaining an initial flat planar configuration of the
8 material web;

9 a second arrangement for initiating a folding process
10 of forming folds along at least some of the fold lines in
11 the material web;

12 a third arrangement for proceeding with the folding
13 process and longitudinally retarding the material web,
14 including at least one pair of counter-rotating bristle
15 brush rolls or bristle brush conveyor belts to form a
16 folded structure; and

17 a fourth arrangement for post-treating the material
18 web on the upper surface and the lower surface thereof to
19 stabilize the folded structure.

1 15. (original) The apparatus according to claim 14, wherein
2 said first arrangement comprises a pair of counter-rotating
3 rolls including at least one roll having a structured

4 surface, a pair of link chains or belts including at least
5 one link chain or belt having a structured surface, or a
6 conveyor belt having a structured surface.

1 16. (original) The apparatus according to claim 15, further
2 comprising an apparatus for varying a running length
3 between said first arrangement for pre-treating the
4 material web and said second arrangement for initiating the
5 folding process.

1 17. (original) The apparatus according to claim 14, wherein
2 said third arrangement further comprises an arrangement for
3 contracting a transverse width and expanding a thickness of
4 the material web, including a pair of counter-rotating
5 rolls having a structured surface and an adjustable axis
6 spacing, or a comb-like arrangement with an adjustable gap,
7 as well as an arrangement for compensating a running length
8 of the material web.

1 18. (original) The apparatus according to claim 17, further
2 comprising a mechanical arrangement or a pneumatic
3 arrangement operating with a fluid pressure for deforming
4 the material web in a direction of the transverse width.

1 19. (original) The apparatus according to claim 14, wherein
2 said second arrangement comprises a row of movably arranged
3 fluid nozzles.

1 **20.** (original) The apparatus according to claim 14, wherein
2 said third arrangement comprises a row of movably arranged
3 fluid nozzles.

1 **21.** (original) The apparatus according to claim 14, wherein
2 said fourth arrangement comprises a pair of
3 counter-rotating rolls, conveyor belts, or link chains or
4 belts, having a structured surface including a pattern of
5 edges, and wherein the folded structure has a pattern
6 corresponding to a circumferential development of the
7 pattern of edges of the structured surface of the fourth
8 arrangement.

1 **22.** (original) The apparatus according to claim 21, further
2 comprising an arrangement for heating, cooling, coating or
3 impregnating the material web.

1 **23.** (original) The apparatus according to claim 14, further
2 comprising an arrangement for applying at least one
3 additional material web onto the folded structure.

1 **24.** (original) The apparatus according to claim 14, further
2 comprising an arrangement for cutting and transporting-away
3 the material web.

1 25. (new) The method according to claim 1, wherein said step b)
2 comprises forming said repeating pattern of fold lines in
3 said material web from both said upper surface and said
4 lower surface.

1 26. (new) The method according to claim 1, wherein said
2 repeating pattern of fold lines comprises respective
3 pluralities of said fold lines intersecting one another in
4 respective star patterns at respective intersections.

1 27. (new) The method according to claim 1, wherein said
2 repeating pattern of fold lines forms a continuous field of
3 surface areas that are respectively bordered and enclosed
4 by said fold lines and that border one another along said
5 fold lines in said material web.

1 28. (new) The apparatus according to claim 14, wherein said
2 first arrangement is adapted to pre-treat the material web
3 from both the upper surface and the lower surface.

[RESPONSE CONTINUES ON NEXT PAGE]